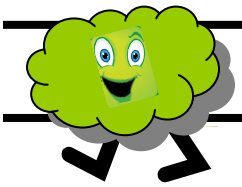

Clean Air, How Far We've Come?

Air quality has changed a lot over the past 100 years. **Air pollution** makes the air dirty, sometimes a little and sometimes a lot. Depending on where you live, the air quality may have gotten better or worse. New air quality laws, advances in technology, and changes in the way we live our lives have all had a huge impact in reducing air pollution and cleaning the air we breathe every day.

ACTIVITY:

Part A- The Interview

To learn more about how air quality has changed over time, interview an older adult about what they remember about air pollution as they were growing up using the Adult Interview Form below. Ask them to respond to the questions based on what they remember growing up (write those answers in the "Past" column) and also ask them how they would answer the questions today (write those answers in the "How about today?" column). Try and interview someone like a grandparent or older neighbor (preferably someone who was born before 1940).

Name of the person you interviewed?_____

How do you know them? _____

Adult Interview Form

Questions	Past	How about today?
1. What year were you born?		
2. Where did you live? (city, state, country)		
3. Did you spend most of your time in the city, suburbs, or countryside?		
4. Did people talk about air pollution or smog when you were growing up? What did they say?		
5. How did you know if the air quality was good or bad each day?		
6. Did the air pollution impact your health, activities, or life? How?		
7. When you were my age, how many cars, if any, did your family have?		
8. How did you get around most of the time? Car, bus, walk, bike, etc.		
9. What type of electronic appliances/gadgets did you use?		
10. Did you try and save energy? (example: turn off lights when not using) If so, how?		
11. Do you think the air pollution is better or worse today than it was when you were growing up? Why?		

Now, use the form below and answer the questions yourself.

Student Form

Questions	Answers
1. What year were you born?	
2. Where do you live? (city, state, country)	
3. Do you spend most of your time in the city, suburbs, or countryside?	
4. Do people around you talk about air pollution? What do they say?	
5. How do you know if the air quality is good or bad each day?	
6. Does the air pollution impact your health, activities, or life? How? 7.	
8. How many cars does your family have?	
9. How do you get around most of the time? Car, bus, walk, bike, etc.	
10. What type of electronic appliances/gadgets do you use?	
11. Do you try and save energy? (example: turn off lights when not using) If so, how?	

Summary- Compare your answers with the answers of the person you interviewed.

Write a summary explaining how people's views about air quality have changed throughout the years. Did the area the person lived in seem to make a difference in their answers? Can we learn anything from the past that will help us have clean safe air to breathe in the future? Explain.

Part B –Air Quality Events Timeline

As a class, create a picture timeline using the events listed below. Most of these events have either impacted the air quality around us or given us information to make better decisions for the environment and our health (Ok, so we added some non-air fun facts too). Include the year you were born, the year your school was built, and some interesting facts/stories from your interview on your timeline too. For each event include a picture that describes the event along with a short explanation. Share the timeline with someone else or post a class timeline somewhere in your school so everyone can learn from it.

Air Quality Events Cards

1922 - Lead added to gasoline Lead was added to gasoline to help car engines run better. But when cars burned gasoline to run they released a lot of lead into the air. People then breathed that air into their bodies which caused big health problems, especially in young children- YIKES!	1930's - Legos were first designed in Europe You know those fun-colored building blocks that stick together? Can you believe that they were created over 80 years ago in Denmark? Some toys never get old.

1948 - Donora Disaster On the evening of October, 16th a zinc company released a cloud of very harmful dust and gas into the air in Donora, Pennsylvania (a town just south of Pittsburgh). Twenty people died and 7,000 people had to be brought to the hospital because they couldn't breath.	1967 - Green Bay Packers Win SuperBowl I Against the Kansas City Chiefs at Los Angeles Memorial Coliseum, the Green Bay Packers win SuperBowl I. Score 35 - 10. GO PACKERS!
1968 - First "whole globe" picture of the Earth Astronauts of the Apollo 8 space mission to the moon took the first pictures of the whole earth from space. It was the first picture many people ever saw of our Earth and it helped them understand that we all need to take care of our beautiful world.	1970 - First Earth Day Wisconsin's U.S. Senator Gaylord Nelson helped organize the first Earth Day on April 22nd, 1970. People from all over the country organized and took part in events that helped teach people about the environment. Events like this really helped bring attention to the environment and started to get people thinking about how their actions might harm the environment.
1970 - The Environment Protection Agency (EPA) was Created EPA was created to protect human health and the natural environment (air, water, and land) that all living things depend on to live. One of the first jobs given to EPA was to protect the public's health from air pollution – the Clean Air Act gave them that job the same year EPA was created.	1970 - Clean Air Act was Signed Congress signed the Clean Air Act which helped create laws to make our air cleaner and healthier to breathe. The laws passed as part of the Clean Air Act limited the amount of harmful air pollutants from industries and protected people's health and the environment. Imagine how dirty our air would be today if everyone could just release all kinds of harmful things into the air- YUCK!
1973 - Environmental Protection Agency (EPA) starts to take lead out of gasoline The EPA started to require gas companies to remove lead from gasoline used by cars and trucks. It actually took a long time before all the lead was removed. This didn't happen until 1996, but as the amount of lead in gasoline got lower so did the amount of lead in the air that was causing health problems- YIPPEE!	1987 - Airplane started monitoring air quality around Lake Michigan So what is an air quality monitor? An air quality monitor measures the amount of pollutants in the air. Airplanes were used to monitor ozone, a gas that is harmful close to Earth. Measuring these pollutants is important because if there is too much pollution in the air, some people will have a hard time breathing and could start to have other health problems. The airplanes could fly over large areas and find out where some of the pollution was coming from. Scientists learned that air pollution could travel hundreds and even thousands of miles.
1992 - Wisconsin Starts Biomonitoring Program So what is biomonitoring anyway? Biomonitoring is using plants, animals, or entire ecosystems to tell if our environment is polluted. Scientists looked for special spots on **lichens**, white pine trees, and milkweed plants to know if there were high levels of an air pollutant called ozone where the plants grew. Plants can show a historical record of an area, including the history of the air! Machines that measure air quality show just a snap shot of time.	1994 - Lead in Blood Drops The amount of lead in the blood of American kids (1-5 years old) dropped by more than 75% between 1976-1994. That's a lot! The laws created as part of the Clean Air Act helped make this happen. This meant there were fewer kids that had health problems because of the lead in the air they were breathing. GO CLEAN AIR ACT!

1995 - Ozone Monitor on Badger Ferry An ozone monitor was installed on the Badger Boat Ferry that carries people and cars across Lake Michigan between Manitowoc, WI and Ludington, MI to track where air pollution was traveling. So what is an ozone monitor? It's a piece of equipment that measures the amount of ozone in the air. Ozone is something that's formed in the air when a mix of pollutants bake in the sun. Too much ozone in the air can cause breathing and other health problems. It's important to measure how much is in the air to warn people sensitive to ozone.	1995 - Ozone Action Days in Wisconsin Ozone is formed in the air when a mixture of pollutants bake in the sun. Too much ozone can make it hard to breath and cause other health problems. In 1994, our neighboring state Michigan started warning people when scientists predicted harmful levels of ozone and asking them to cut back on polluting activities (like driving cars) to keep the air clean. They named these days Ozone Action Days. In 1995, all four states surrounding Lake Michigan (can you name these states?) began identifying Ozone Action Days.
1999 - Environmental Protection Agency (EPA) created the Air Quality Index (AQI) The AQI is a tool to tell people how good or bad the air quality is everyday. When the air is good or ok you'll see a green or yellow color, but when the air quality is poor and can be harmful to your health you'll see an orange or red color. Check out http://airnow.gov to find out the air quality where you live.	1999 - Dora the Explorer TV Show Dora the Explorer TV show started this year. Even today, you can find pictures of Dora, Boots, and Diego on everything from coloring books to pajamas. "Dora, Dora, Dora, the Explorer…"
2001 - Lake Michigan Air Cameras Many types of air pollution are invisible but some can be seen with the naked eye. Haze occurs when air pollutants hang in the air and it reduces our ability to see far away buildings or shorelines. Haze looks a little bit like fog but it typically occurs during drier weather and is mostly a problem near cities. Haze cameras were put up in the states surrounding Lake Michigan to measure air quality. You can see how clear or dirty the air looks by checking out the view from cameras on the Internet http://www.mwhazecam.net/milwaukee.html.	2001 - I-pod is Brand New The Apple Company created a new easy-to-use gadget to play and listen to music.
2006 - Wisconsin Air Quality Watches and Advisories Since we can have air pollution problems not just from ozone, a gas, but also from very very small particles in the air, Wisconsin switched its air pollution warnings from Ozone Action Days to Air Quality Watches and Advisories, which can be triggered by either kind of pollution. The new system is a little like the tornado warning system and was developed by the National Weather Service. When scientists think the conditions are right that we MIGHT get too much air pollution, they announce an Air Quality Watch and ask people to be cautious and to protect the air – like driving less or waiting until later to mow the lawn. If the air pollution levels BECOME too high to be healthy, they issue an Air Quality Advisory to tell people to protect their health – like staying inside or not doing really active exercise.	2008 - Summer Olympics in Beijing, China USA won 110 medals, more than any other country! But these Olympics were good for another reason – they pushed China to look harder at their air quality problems. To make the air in Beijing cleaner for athletes and visitors during the Olympics, car and truck traffic was limited, polluting construction was stopped, and less coal was burned. These techniques worked so well that the city decided to continue some of them even after the Olympics ended.

Clean Air, How Far We've Come - Teacher's Supplement

Learning Objectives:

- Discover how air quality and citizen awareness of air quality has changed over the years.
- Identify key events that have led to understanding and citizen action related to air quality.

Subjects:

- Social Studies
- Language Arts
- Science

Materials:

- Adult Interview Form
- Student Form
- Air Quality Event Cards
- Crayons/markers/colored pencils
- Butcher block paper
- Magazines
- Scissors
- Glue

Background Information:

∗ Teachers, please remember to post or make available the bold-faced vocabulary word definitions.

Part 1 - The goal of Part 1 is for the students to learn first hand through interviews what people's perceptions of air quality were when they were growing up and how (or if) those perceptions have changed today. By interviewing others, students will get a better idea of what the air quality was like in the past and how it has changed for the better or worse.

Prior to having students conduct interviews, you may want to ask the students some questions regarding air pollution sources and solutions so they have a better idea of how the questions relate to air quality. Go through the interview questions together before sending the students out to conduct their interview.

1. What are the main sources of air pollution? Burning of fuels such as coal, oil, gas, and wood that we use to run our cars, trucks, factories and power plants.

   About 75 percent of Wisconsin's electric energy comes the following: from coal (65 percent), oil (1.4 percent) and natural gas (8.7 percent).

2. How do your actions impact the air quality around you? Explain that it's likely that most of the energy produced to run all the electric gadgets that make our lives easier (such as lights, furnaces, air conditioners, TVs, refrigerators, and

computers) likely comes from a power plant that burns fuel like coal. Therefore, when we use energy we are requiring the power plants to burn more fuel, which produces more air pollution.

Driving cars/trucks burns gasoline which also is a large source of air pollution.

3. What are some things we can do to reduce air pollution?
   -use less energy at home when possible
   -turn off lights
   -bike or walk whenever possible rather than drive
   - carpool when possible
   -turn our thermostats down and wear more layers
   -take the bus
   -close your shades in the summer to keep house cooler

If this is the first time your students have ever conducted an interview you may want to review simple interview etiquette with them.

Follow Up Discussion - Using the students' interview summaries, have a discussion on how people's perceptions about air quality and their actions have changed, if at all. Some questions to consider:

1. Did the location the person lived in have an impact on their answers?
2. What impact has technology had on air quality?
3. Does it seem like people are more concerned with air quality now or in the past, why?
4. Do people think that the air quality is better or worse now than in the past?
5. Are people taking action to reduce air pollution?
6. What, if anything, can we learn from the past that will help us have cleaner air to breathe in the future?
7. Did you learn any interesting information in the interview that surprised you?

Part 2 - The goal of Part 2 is for students to learn about events in the past that have increased our understanding about air quality and have impacted our overall air quality today.

For this activity, pass out an air quality event card to each student or pair of students. Have the students read the details of their event and create a picture/collage describing the event along with a short description. Include some information/events from the interviews, if possible, as well as some of the fun facts provided. As a class, create an Air Quality Timeline to post either in the classroom or another area of the school where others can view it. Have the students report on their event as they are posting their picture and description. After everyone has posted their event, have a discussion about how these events have impacted our air quality and our understanding of air quality today. Which event(s) were most shocking to you, why? Did you see any common threads throughout the timeline, if so what were they? What can we learn from these events that will help us make better decisions for our health and our environment in the future?